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ABSTRACT

The leaders in education, business, industry, commerce, labor, and community organizations in the Ohio, Kentucky, and Indiana region are challenged to confront problems in training workers for technological occupations. One facet of the problem is the task of meeting immediate manpower needs and the other is the long-range task of providing an educational experience permitting overall understanding of the world of work, career choice, and skill development. Career education provides the potential long-term solution to these problems by preparing all students when they leave high school to either take a job or enter the next step of educational preparation. The components and aims of career education are described. An opportunity is available to members of the American Society for Training and Development and the Chamber of Commerce as individuals and through their agencies to support long-range career education and occupational and adult programs and to help provide the kind of employee training that is needed. Office of Education programs are reviewed. (MS)

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THE FUTURE MANAGEMENT OF TECHNICAL TRAINING*

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(Speech)

I am pleased to be a part of this important meeting of the Cincinnati Chapter of the American Society for Training and Development and the Greater Cincinnati Chamber of Commerce to discuss the future management of technical training. The success or failure of our efforts to expand and strengthen occupational career education in this Nation will in large measure depend upon the extent to which our educational establishment receives the active support and managerial assistance of the Nation's employers. It is particularly heartening to observe the exemplary assistance which employers and other interested persons are providing through the Chambers of Commerce and the American Society for Training and Development in the analysis of, and economical management of, the educational enterprises in their areas.

Your program chairman, Robert MacMahan and his assistant Nick Visnic, have asked that we take a hard look at the future of training for occupational careers in the Ohio, Kentucky, and Indiana region by examining the hard, cold facts, both good and bad, which must be considered as the bases for program actions to insure that businesses and educational institutions keep pace with the demand for technical trained personnel.

This audience represents an impressive cross section of the areas' leadership in education, business, industry, commerce, labor, and community organizations. By being what you are, you encourage me to try to put into perspective some of the major problems confronting this Nation as we prepare our population for the increasingly complex work which must be done in our technological society, and to discuss some potential solutions to these problems. I hope to challenge you and to enlist your talent and support in perfecting and implementing

programs to solve this urgent educational problem.

The nature of the problem facing us in preparing highly competent workers for technological occupations is patently evident when we observe that on one hand, there are thousands of important and attractive jobs in the highly skilled technical and supportive occupational categories which need to be filled in order to maintain the health and well being of our industrial and employment enterprises; and on the other hand, there are thousands of important and attractive jobs in the highly skilled technical and supportive occupational categories which need to be filled in order to maintain the health and well being of our industrial and employment enterprises; and on the other hand, that there are even more thousands of unemployed men and women, many of them young, who cannot fill these jobs because they lack the necessary training.

At the very outset, we must recognize that there are two facets to this problem. One is the immediate task of preparing people in our potential work force, including those in our high schools and junior colleges and those who have left school and are underemployed or unemployed, to be able to meet our immediate needs for technological manpower. The second, and perhaps most important, is the long range task of providing an educational experience for young children which will permit them to understand the world of work, to make logical choices of careers in relation to their personal needs, and to provide a means by which they may continue to upgrade and update their occupational skills and knowledge to keep up with the rapid changes in the kind of work they will be doing because of the discovery of new knowledge and the increased application of science and technology.

Let me first review with you some of the facts about our present

educational processes as they relate to preparing the highly skilled, technical, and supportive occupational personnel required in today's and tommottow's world of work.

Because you are who you are, you encourage me to begin by asking how you got where you are.

Think back for a moment to those early formative years. Did you have a plan -- did your high school help you develop a plan -- for the appropriate career preparation and the subsequent job placement that would enable you to enter and advance in the field of your choice? Only you know how much of that route was planned, how much was due to motivation, perseverance, and hard work, and how much was the right decision at the right time, and how much was simple good luck.

The point is, there, ought to be a better way! And that way ought to be planned and available to all.

I'm sure you agree that much of what is wrong in our society -- and I don't discount all the things that are right in this society -- has to do with the people who did not get adequate career guidance and training ear'y enough and substantially enough to find their way into productive and rewarding fields of endeavor.

Despite our concerted efforts in recent years to make education more relevant for the children and young people in our schools and colleges, our area vocational and technical schools and technical institutes, the record is still not very encouraging either in terms of human resources or financial investment.

In addition, let me share with you some statistics compiled by the National Center for Education Statistics. For example, in the 1970-71 school year:

-- 850,000 students dropped out of elementary or secondary school. Assume that, on the average, they left at the end of the 10th grade. At $8,000 per child for schooling that began in kindergarten or first grade, these dropouts represented an outlay of $7 billion.

-- 750,000 graduated from the high school general curriculum that has traditionally been the dumping ground for students who do not elect vocational training or plan to go to college. At $12,000 per student, total cost to the Nation ran about $9 billion.

-- 850,000 entered college but left without a degree or completion of an occupational program. Assume that, on the average, they left at the end of the first year. These young people added $12 billion to costs.

If you have been adding with me, you know that we are talking about 2.5 million young people and expenditure of some $28 billion. That is one-third of the entire $85 billion cost of education last year. And these young people and expenditures reflect the dropout rate of a single year. If you try to include the millions of dropouts and billions of dollars spent in years past, the losses become astronomical.

What we can never measure are the personal losses of these young people -- their frustrations, their shattered hopes and dreams. Nor can we calculate the contributions they might have made to our National vitality and progress. Who are these youngsters? What happens to them?

A new Department of Labor study U.S. Manpower in the 1970s not only looks ahead but recaps the labor picture in the 1960s. In terms of our social and economic progress, some lines on the charts and graphs for the 60s moved in the wrong direction or, at best, failed to move at all.

-- Teenage unemployment was more than 12% in every year of the decade.

-- The rate for teenagers pf Black and other minority races was double that, running between 24% and 30%.

-- Most significantly, the gap between youth and adult unemployed rates widened. At the beginning of the decade, unemployment among the 16-19 age group was 3 times greater than for adults 25 or over. By 1969, over 5 times more teenagers were out of work than adults.

Projections show that 100 million Americans will be working or seeking work by 1980. That's 15 million more people, mostly young, who will have to be accomodated in the labor force by 1980 than we had in 1970. If 2.5 million youngsters are now leaving our schools and colleges each year without adequate preparation, how many of those 15 million are apt to be unprepared for the demands of the 1980 labor market? Compated with 1968, that market will need 50% more professional and technical workers -- but 2% fewer laborers and a whopping 33% fewer farm workers. I parenthesis, let me add that the Department of Labor sees exactly the same number of openings for teachers in 1980 as 1962, about 40,000 fewer than the peak years of the late 1960s.

Despite a projected rapid growth rate in the "professional" occupations, a Labor Department study of the jobs which will be available in the coming decade indicates only about one in five (20%) will require baccalaureate education preparation. The Department of Labor's Occupational Outlook Handbook projects a 13 per cent increase in blue collar jobs between now and 1980 and a 36 percent increase in white-collar position. Service-producing industries (trade, government,

health care, education, transportation, repair and maintenance, finance, insurance, real estate) are expected to grow from 44.2 million people in 1968 to 59.5 million by 1980, a 35 percent increase. The work force in goods-producing industries (agriculture, mining, construction, manufacturing) is expected to increase from 27.5 million to 30 million, a 10 percent increase.

These are the hard facts. Now what can we do about them?

First, let us consider the long range problem of change toward a more viable program to prepare our youth to meet our nation's increasing technical and related manpower needs.

CAREER EDUCATION - A LONG RANGE SOLUTION

There is abundant evidence which clearly indicates the needs for long range improvements in the education of our people from early childhood throughout their working lives. After reviewing the facts which we have just discussed, the Vice President of the United States in an address delivered to the American Association of School Admnistrators' Convention in Atlantic City, New Jersey on February 16, 1972, cited career education as a potential solution.

He said:

"What has disturbed me, as it has disturbed many of you, is that, while our present system of education does teach our young people to think, even to care, it is not adequately preparing the majority of them to earn a living commensurate with their desires, their interests, their talents or the Nation's needs.

Surely, we should, we must ask more of education.

Surely, we can acquaint our children early enough with the myriad

career choices available in this diverse economy of ours and surely, we can prepare them to occupy a satisfying place in it. Surely, we can if we will -- if we have the vision and the courage to explore new areas, to embrace a brand new concept in education.

President Nixon calls the new concept Career Education, and he has made it one of his high priorities."

It is precisely because of the seriousness of the educational problem which our Nation currently faces that all of us in the United States Office of Education (USOE) are placing so much emphasis on the concept of career education.

For too long, our educational system has assumed that all our youth must be prepared to earn a baccalaureate degree when in fact fewer than twenty percent have in the past graduated with baccalaureate degrees into professional and managerial jobs. Furthermore, the Bureau of Labor Statistics predicts that in the foreseeable future, 83 percent of the Nation's work will not require a bachelor's degree preparation! Fewer than 30 percent of our students now receive vocational preparation which will enable them to get a job when they leave high school and over 50 percent of our youth receive an education which neither prepares them to enter further education beyond high school with reasonable assurance of success nor to become employed. Career education, as we conceive it would guarantee that all students, when they leave high school, will be prepared either to take a job or to enter the next step of educational preparation for their chosen work.

For the past year and a half, career education has been a major

objective of the USOE. No USOE initiative has attracted more attention nor received more support!

Career education actually relates to all education experiences from early childhood throughout the productive life of the individual. In early childhood it provides an awareness of the world of work, and some direct, hands-on experiences to motivate and captivate the learner's interest.

At the end of high school, the burden is on the school system to give strong, positive assistance to the students in obtaining job placement, or placement in a post-secondary institution, whichever the student chooses. Thus, a strong accountability factor is built into career education.

The development of a career education system requires the accomplishment of differing objectives at each level of the existing school system. For example, in kindergarten through the sixth grade, the objectives are to develop in each pupil self-awareness and positive attitudes about the personal and social significance of work. Students in these grades receive a meaningful overview of the world of work by being exposed to job clusters. The USOE has developed fifteen major clusters that encompass the 20,000 different job categories listed in the Dictionary of Occupational Titles.

In the seventh and eigth grades, students devote more attention to the occupational clusters of their choice, leading to an in-depth exploration at the ninth grade. Subject matter also is more meaningful and relevant because it is unified and focused around a career theme.

In grades nine and ten, the student gets in-depth exploration and training in an occupational area, and is provided a foundation

for further progress. This leaves open the option to move between clusters.

In grades eleven and twelve, the student receives intensive preparation in a selected cluster, or in a specific occupation, in preparation for job-entry or further education. His studies are related more closely to the world of work. Guidance and counseling are more concentrated. The school is obligated to assist the student in obtaining a job, entry into a post-secondary occupational education program, or entry into a four-year college program.

Career education in our technological society is designed to provide new dimensions to the education of all Americans. These are some of its most urgent objectives:

* It aims to lead all persons to respect the dignity of work well done, and to hold in high regard those who do it.
* It aims to acquaint all of our youth with a knowledge of all the different kinds of work which must be done in our complex technological society and to kindle in each the desire to master so e exciting job which needs to be done, one which uses a full measure of his abilities and which will make him self-supporting and self-respecting.
* It aims to reduce the disgraceful failure and attrition rates in our high schools and colleges, often caused by ill-advised or unrealistic career choices or inadequate scholastic preparation.
* It aims to insure all against the debilitating and eroding effects of enforced unemployment. Constantly available options to continue career education at any stage of age in a career

will open the way if we but provide the educational opportunities.

* It aims to enable more people of all ages to spend more time in organized study whenever they need it to keep up with changes in this society's complex technological work.

Let us examine how these aims may be accomplished.

CAREER EDUCATION FOR EVERYONE

Career education, as the concept is now evolving, will begin as early as kindergarten. Revised curriculums will relate reading, writing, and arithmetic to the varied ways in which adults earn a living. These careers have been grouped by the Office of Education into families or "clusters" of occupations, as follows:

AGRIBUSINESS

BUSINESS AND OFFICE

HEALTH

PUBLIC SERVICE

ENVIRONMENT

COMMUNICATIONS & MEDIA

HOSPITALITY & RECREATION

FINE ARTS & HUMANITIES

MANUFACTURING

MARKETING & DISTRIBUTION

MARINE SCIENCE

PERSONAL SERVICES

CONSTRUCTION

TRANSPORTATION

CONSUMER & HOMEMAKING

The elementary occupational awareness and the prevocational and exploratory education starting in the middle and junior high schools are aimed at providing an occupational literacy and familiarity with the world of work. This helps to inform the student about the variety of challenging and interesting work in the modern world and society's need to get it done. It also builds respect for those who do it.

The concept relates to the subjects taught by all teachers so that real career-centered learning will be used to provide an interesting emphasis and heighten student interest and motivation whether the class deals with history, language, general science, health, social science, or whatever.

As each youngster advances into junior high school, he will select various clusters or broad groupings of related occupations and begin exploring the nature of specific careers in each one. By senior high school, he will concentrate on the group of career opportunities which interests him most and will develop sufficient entry level skills in a specific occupation to qualify for a job.

It is visualized that students will have an opportunity to enjoy actual work experience during their high school years through cooperative arrangements with employers. Yet each student's program will remain flexible enough to enable him to switch to a related occupation later with a minimum of supplementary training. In addition, each student in a career education program will keep his options open.

It is expected that the career education cluster approach will provide better educated youth to enter either professional preparation in a four-year college or the post-high school programs which educate

technicians or similarly specialized personnel.

Career education beyond the high school includes preparation required by an individual to enter employment, improvement of his knowledge or skills as they relate to his job, or preparation for new ones throughout his working career. It also includes the cultural and recreational knowledge necessary to cope with living in the post industrial society. Man cannot live by bread alone!

Much progress is being made in the States in developing and initiating long range career education programs. We earnestly hope to enlist your personal efforts and support for this needed long range change in educating our people for work and life in our technological society.

HOW CAN WE MEET PRESENT (SHORT RANGE) TECHNICAL MANPOWER NEEDS?

It is becoming increasingly clear that the largest increase in job opportunities in the Nation's workforce is now and will continue to be for persons who have earned less than a baccalaureate degree but who have the specialized skills and knowledge to support the professionals in the Nation's work and to guide the efforts of the skilled and semi-skilled persons at the technical and specialists level in all major fields of work. The education and work experience required to prepare such specialized supportive people must be based not only on high school preparation but extends to technical education beyond the high school as well.

How can we now increase the supply of urgently needed, technically prepared, supportive personnel for industries and agencies such as yours? The stern and realistic facts of life demand that we start with

our present manpower resources. Every year thousands of our young people graduate with varying degrees of preparation from high schools and must have futher educational preparation before they can perform the jobs which most employers seek to fill. Graduates of junior colleges and even four-year colleges with liberal arts degrees and little useful industrial employment preparation also comprise a part of the potential manpower which has to be trained. Returning veterans and persons who have recently graduated from or left high school and have been employed part-time or full-time on unskilled jobs further swell the ranks of the potential population which can aspire to fill technical or supportive career occupations. Finally, there is a large reservoir of persons already employed who have demonstrated their willingness to work and their quality as employees, but who are working at tasks far below their potential. They represent another very important part of the potential specialized supportive work force.

There is already a large establishment which can serve the needs of most of these individuals. Programs beyond the high school in Junior and community colleges, four-year colleges, technical institutes, private and public, specialized proprietary schools, and some area vocational and technical schools provide post high school programs for employed adults and for others available for full-time preparation.

It is in this establishment that well conceived, rigorous, and flexible educational programs in mechanical design, instrumentation, electronic data processing, allied health, and numerous other technicians and specialists, and highly trained office and warehouse workers, secretaries, personnel specialists and a host of other persons can be prepared. The establishment is already there and being supported by

federal, State, and local tax dollars.

UPGRADING SKILLED OR SEMI-SKILLED EMPLOYEES IN POST HIGH SCHOOL PROGRAMS

The thousands of employed persons in industrial and governmental agencies present special problems and challenges and a special potential value in the solution of the problem of preparing more and better occupational career specialists for today's and tomorrow's needs.

When an electronic or other needed technician education program is established in a community college, technical institute, area technical school or division of a 4-year college, and only when the program is established, there is a optimum environment for approaching the important task of providing supplementary organized study to upgrade already employed, related semi-skilled mechanics or skilled workers to the technical level.

When a community college or a technical college has an adequate department head and skilled teachers of technical specialties, and of mathematics and physics and chemistry as they apply to the technology, the ground work is all done and the environment is ideal for bringing the specialized scientific education and its related mathematics to ambitious and highly motivated mechanics and skilled workers who are already on employers' payrolls.

If a sufficient number of persons are available in one employer's plant, the teachers can be brought to the plant. Usually, however, it is better if the employees can be taken to the classes on campus with laboratories and a formal school environment, taught by the knowledgeable persons who understand adult educational psychology and who also are knowledgeable about the technical specialization of the field. These

appear to be elements of a situation in which motivated full-time employees can be taught the aspects of their technical background which they lack.

The motivation of older employees often seems to be an area of some difficulty for employers. Systems of providing weekly or even daily released time with pay for selected employees has been very successful. Employees who are willing to study and who exhibit the characteristics of ambition and capability to aspire to the technician or similar occupational specialist level are given short, intensive courses in technical programs planned particularly for them by the employers and school staffs. This has the educational advantage of permitting the employees who are working most of the time on the job to apply such newly-learned information daily.

To start such programs in an established institution with an on-going technology program requires planning, and above all, support by the employer. To inform candidates who are already employed that the programs are available and approved by the management is usually not enough to stimulate them sufficiently to undertake the study. It may not even be enough to suggest to them that, if they study, the company will pay the cost of successfully completed schooling. Employed workers with 10 or 15 years of experience often are so busy with family responsibilities, other off-the-job duties and activities, and recreational interests that they find it very difficult to arrange formal study.

The British "block time release" (or sandwich) programs of formal study supplementing daily work seem to succeed because the selected employees go to school to programs planned by their employers and the school staff and because the employees are paid when at schools at

the same rate as if they were at work.

To make such a program succeed involves difficult policy decisions, cost decisions, inter and intra-organizational adjustments and arrangements on the part of the employer. However, it may be that the seriousness of the need for better qualified technical and supportive workers in a wide variety of technical and related fields should cause the necessary adjustments and expenditures to be made.

THE POTENTIAL LEADERSHIP ROLE OF THE AMERICAN SOCIETY FOR TRAINING AND DEVELOPMENT AND THE GREATER CINCINNATI CHAMBER OF COMMERCE

Recent federal legislation emphasizes education as an important investment in people, and as a major element in the structure of our society. All phases of occupational education are being strengthened as a result.

It follows that as more highly trained personnel are needed, and are employed, the number of good occupational programs must increase. The task has just begun. Educators cannot carry this new and tremendous burden alone. The guidance and assistance of the future employers of these trainee are needed if we are to succeed. Walter F. Carey, a past president of the Chamber of Commerce of the United States said:

> "The business man is the key element in this whole education picture. Far better than any educator, or government administrator, he is in a position to know what his company's skill requirements will be for the next five years, the next ten years. And the smartest thing he can do is to let the educators in his community in on the secret so they can adjust their program accordingly ... Some communities that now are operating effective vocational-tech-

nical schools have as many as 43 advisory committees involving up to 500 businessmen. Here trained management men put their knowledge and experience to work on the real core of the problem: How best to prepare men and women for productive jobs that exist today and for new opportunities that will open before them as our technological revolution progresses."

A priceless opportunity is available to the members of both American Society for Training and Development and the Chamber of Commerce as individuals and through their agencies to support both long-range career education and occupational and adult programs and to help us provide the kind of employee training that is needed. High quality is a mandatory requirement for successful programs. A competent, trained teaching staff, laboratories well-equipped with apparatus representative of that used in most up-to-date industrial establishments, a good library, adequate classrooms, and administrators sincerely dedicated to quality post-secondary occupational education are essential. It takes a minimum of five years and many thousands of dollars to establish a new program, assemble the staff, equip facilities, and graduate the first class or two. When these graduates are successfully employed and confidently advertising their success to their peers and parents, the program will be well on its way.

A poor program is by far the most expensive of all because it costs almost as many dollars as a good one, wastes the time and the effort of students and school staff, and, worst of all, disappoints potential employers, and disillusions students and their parents. It's obvious then that we can't afford poor programs!

The most important service you can render is to become involved as advisors, consultants, and supporters of occupational programs in the State and local organizations which administer them. The authors of the Vocational Education Act of 1963 and the Education Amendments of 1972 clearly saw the necessity for knowledgeable employers to advise, counsel, and support occupational educators if we are to provide high quality training for their future employees. In fact, the Congress made such advisory services a mandatory part of the administration of the legislation at all levels.

I hope that some of you are already serving on such advisory groups and that others will soon follow suit. Let it be known that you are available for such duty since there is a clear advantage to knowing from the inside exactly what goes on in this field.

Many of you may wish to know where to go for information and whom to contact on such programs.

Broadly speaking, there are three levels of contact. I represent the Federal level as Associate Commissioner for the Bureau of Adult, Vocational, and Technical Education. The Bureau is maintaining a headquarters staff in Washington and a field staff in ten regional offices throughout the country. These staffs are always available to the general public for advice and assistance in connection with problems having to do with occupational training. You are invited to write directly to me or phone my office at any time, or to contact the nearest regional office of the Department of Health, Education, and Welfare, for the same service from the regional representatives of my office.

At the state level, the State Directors of Vocational Education are the chief administrators. Through State Boards for Vocational Education,

these men exercise the main control over funds for vocational and technical education in their States. Usually, their staffs at the State capitols include a director of technical education and one or more specialists in this field whose major duty is to work directly with the local education institutions on such programs. They are, however, also available to provide information and assistance to the general public.

At the local level, your best contact would be with the chief administrators of the local schools, colleges or other institutions which offer, or in some cases, which should offer occupational education programs. These people work with their State officials, of course, to receive and use Federal and State funds, and to get advice and assistance on program problems which arise from time to time. Through these State officials, they also have available Regional and headquarters staff personnel of the U.S. Office of Education.

Let me give you two examples of curriculum development to help illustrate the rich educational diversity among our State and local school systems a well as the cooperation between industry and education.

The U.S. Office invested $2 million over a three-year period to develop junior high school curricula in the construction and manufacturing clusters. The curriculums were tested in 25 schools and have proven eminently successful.

Meanwhile, the State of Oregon which has pioneered in developing the cluster concept expects half of its students to be in cluster programs by 1975. It has developed and refined 12 of our potential 15 clusters on the basis of its present and project employment needs.

During the past school year we funded at approximately $2 million six school-based career education projects in Districts who had already shown creative initiative in this direction: Mesa, Arizona; Los Angeles, California; Jefferson County, Colorado; Atlanta, Georgia; Pontiac, Michigan; and Hackensack, New Jersey; representing cross-sections of various urban and rural population groups. The six currently are concentrating on massive planning, teacher training, and curriculum development. We also expect to distill a master career education program from these States which will serve as a model for other school systems throughout the Nation. In addition to these six major sites the Office, is funding 100 limited career education model projects -- at least one in each State -- which are serving 700,000 students.

In addition to these school-based models. The Office is pressing forward with the development of three other career education models, alternatives to the conventional school systems as we now perceive it.

The second model, of significance to this audience, is the employer-based model. This is envisioned as a total education program for a cross-section of oungsters 13 to 18 who find conventional schooling irrelevant or unchallenging and want to try a different approach. Operated by a consortium of private and public employers, the model will use, under contract, employer know-how and where appropriate, employer facilities. Subject matter at the employer-run learning center with credentials at least equal to those offered by their high school or they will return to their high school with full credit for work completed. Projects supported by more than $2 million in Office of Education funds and utilizing this model are underway. They will serve experimentally about 100 students

each in Portland, Oregon; Charleston, West Virginia; Philadelphia; the San Francisco Bay Area; and perhaps one or two other locations.

Let me describe the Philadelphia operation. The cooperating employers' sites will be known as the Academy for Career Education and, while eventually covering grades 9 through 12, will consist entirely of 11th graders when it begins pilot operations in October. The Academy program is being developed under the Office of Education grant by Research for Better Schools, Inc., a non-profit corporation which is part of a network of educational laboratories. RBS's efforts are directed by a board from a three-State region representing public, private and higher education, and business and industry. Broadly, the instructional program is divided into three areas: exploratory, academic and job-relating. Instruction will seek to integrate academic learning with actual experience at employer locations. Students not only will be prepared for and learn how to hold down a job, but they also will be prepared for entry into society as responsible citizens with a sense of personal worth, and competence. Participating employers will provide space, instructional personnel and materials, program support, administrative expertise and opportunities for actual student experience and exposure. So far 13 employers -- including a bank, an oil company, a hospital, and the Philadelphia Chamber of Commerce -- plan to participate in the Academy program. Contracts and discussions are still underway with additional business firms.

The long-range effectiveness your society or agency's contribution may well be realized to the degree that its members, or the education committees and employers they represent, assist schools in implementing both the currently needed technician and specialist training programs and the career education programs which are evolving at all levels.